Summary of Shimming Results in 21Q40 Quadrupoles

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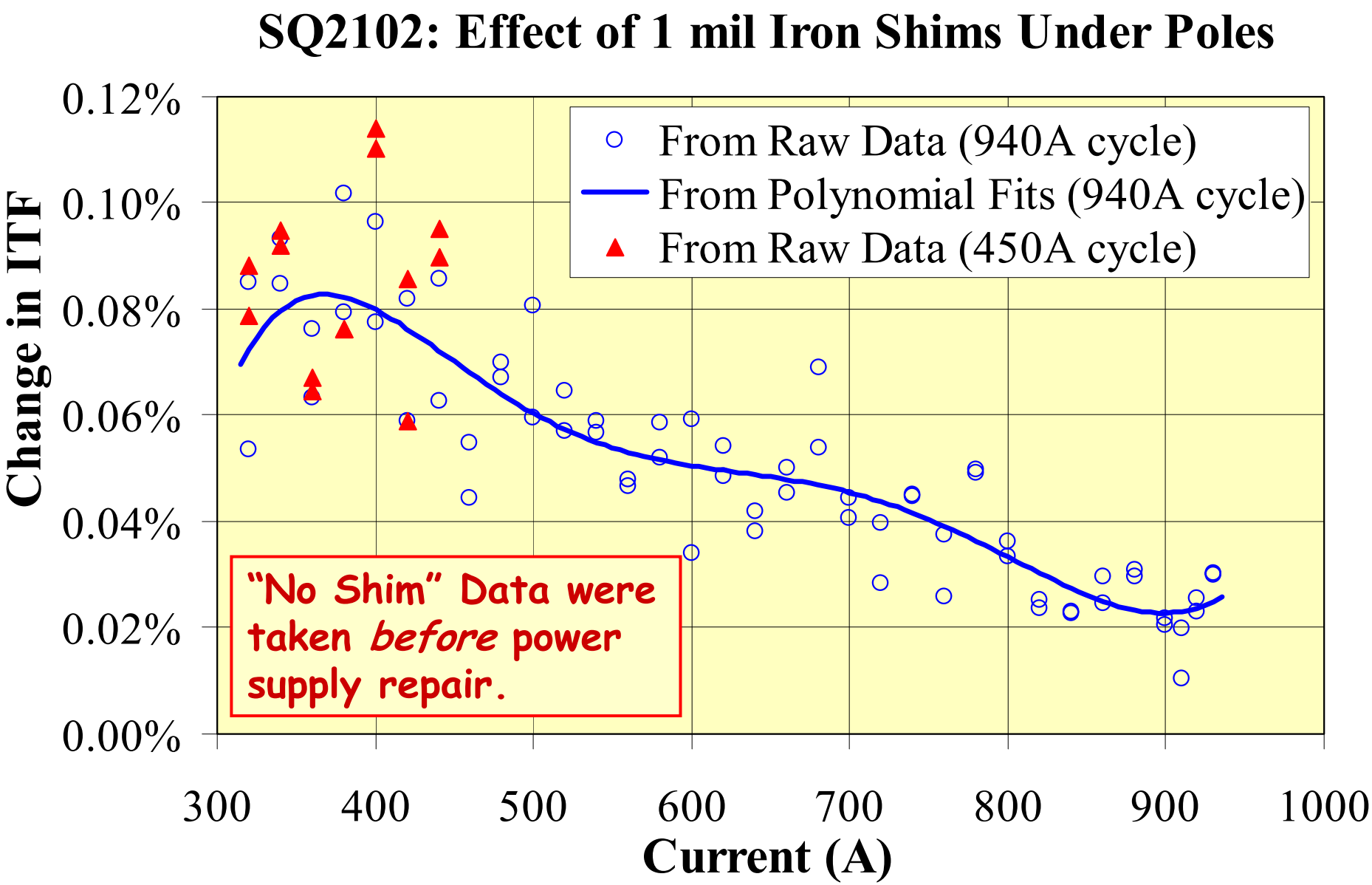
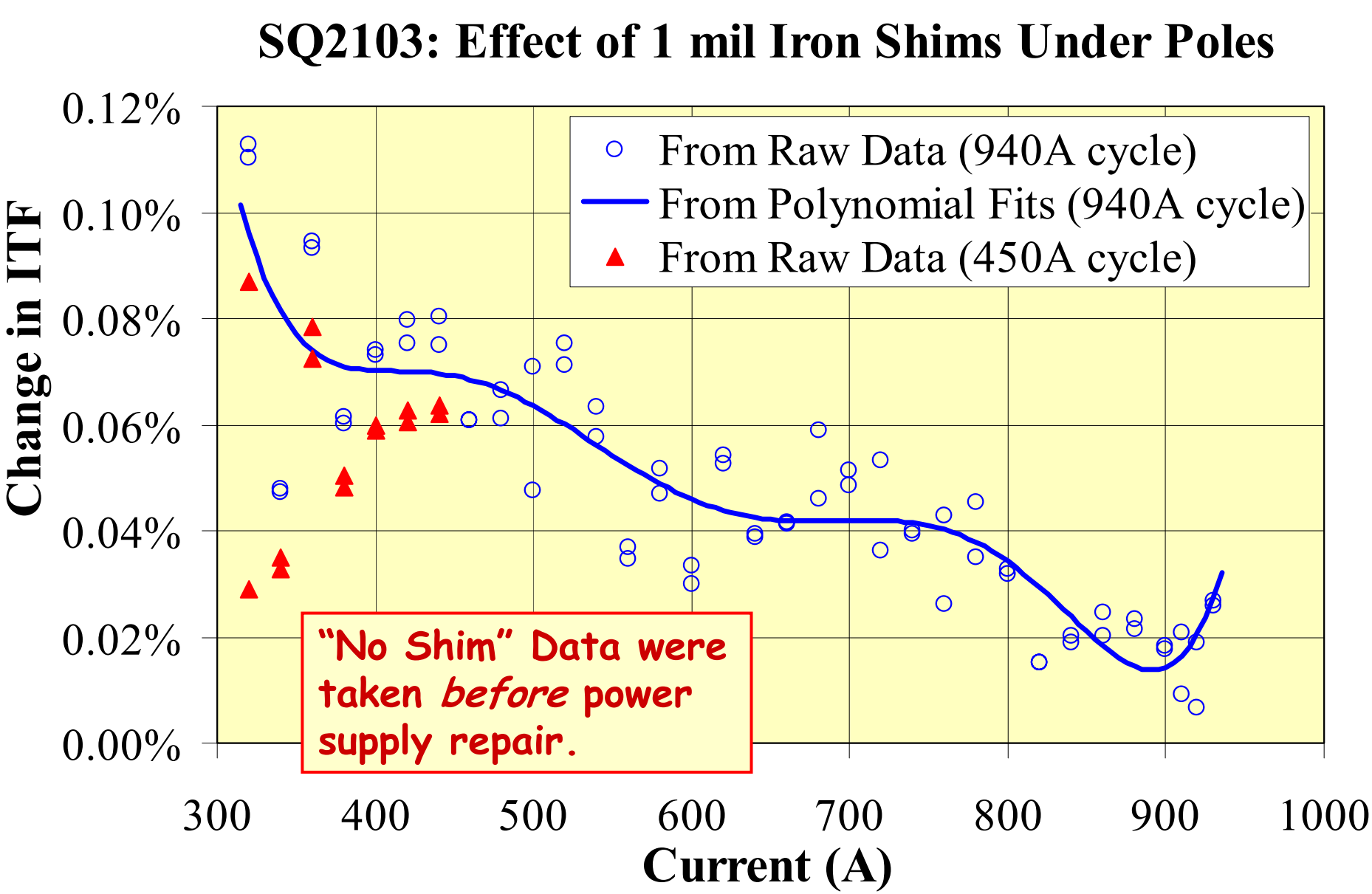
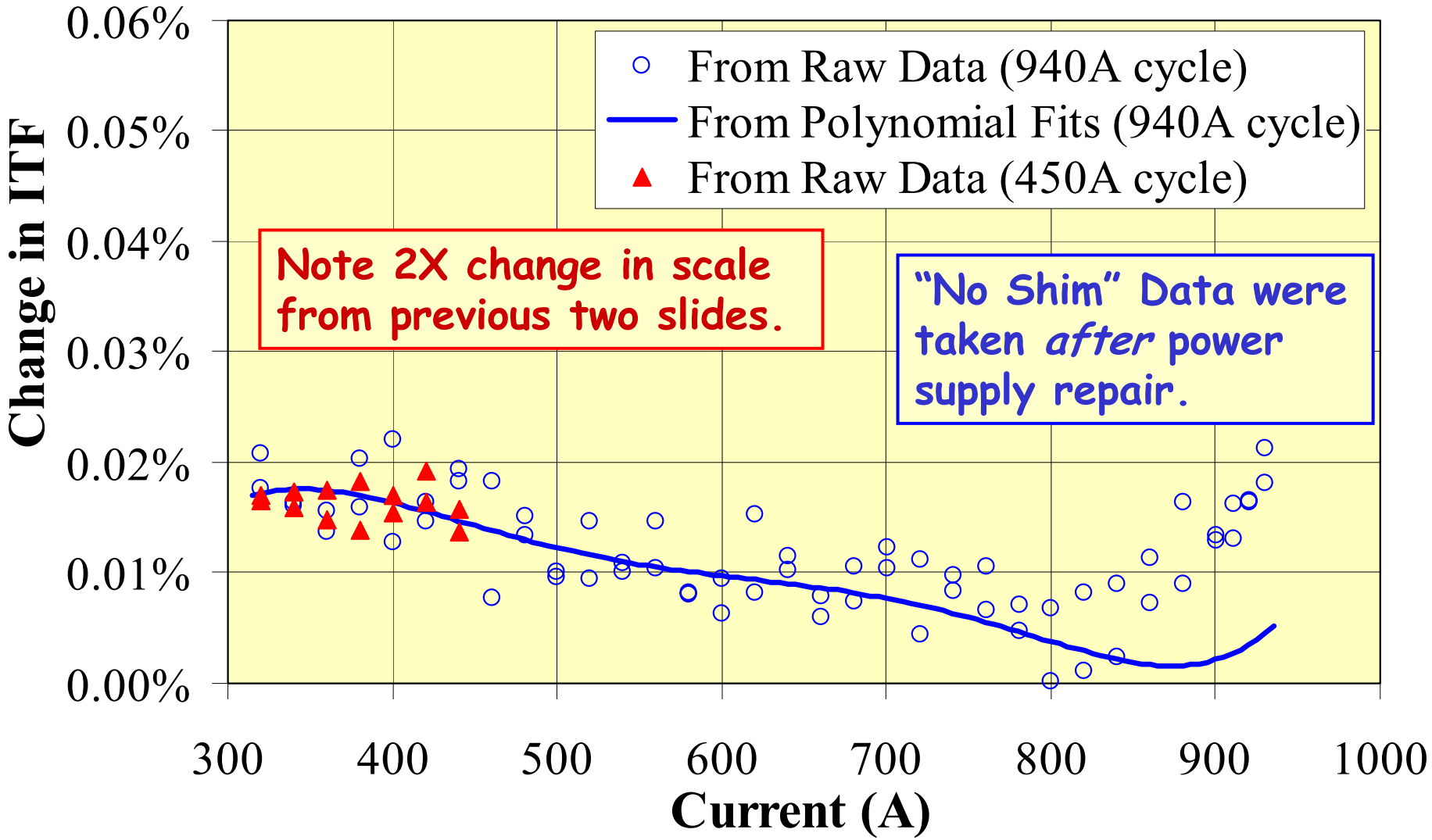
Shimming Results in 21Q40

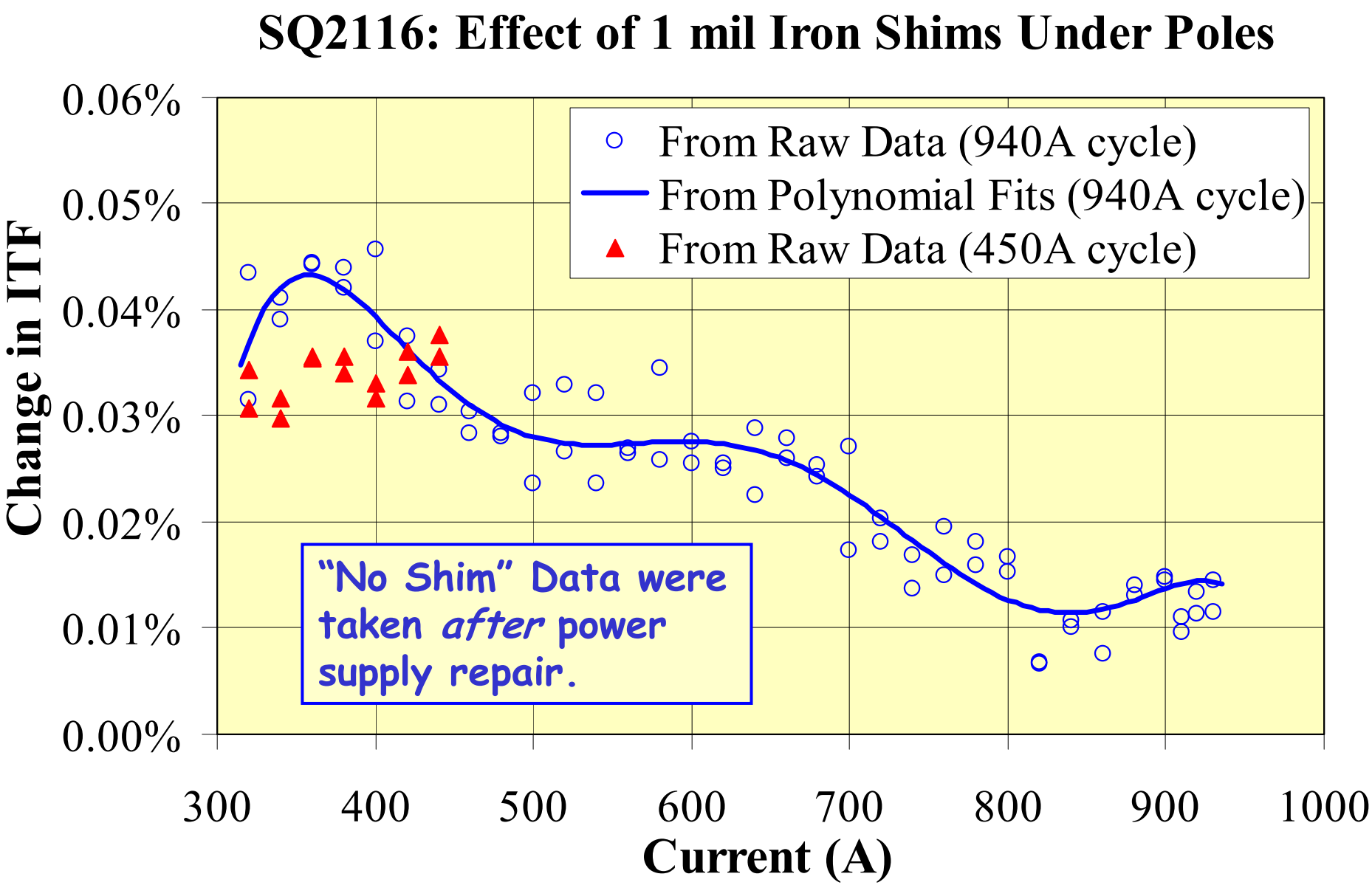
- Six quads with 1 mil iron shims (Sl. No. 2, 3, 15, 16, 20, 23)
- One quad with 1 mil stainless steel shims (Sl. No. 14)
- Sl. No. 2 and 3 were measured without shims early in the program, before power supply was repaired.
- Results for Sl. No. 2 and 3 are significantly different from the remaining quadrupoles (Sl. No. 15, 16,20,23).
- Results for 940 A cycle agree with those for 450 A cycle, except for Sl. No. 20, where results disagree by ~0.02%.
- Ignoring Sl. No. 2 and 3, the change in I.T.F. has an RMS variation of 0.01%.
- **Stainless steel shims significantly reduce the I.T.F. !!**

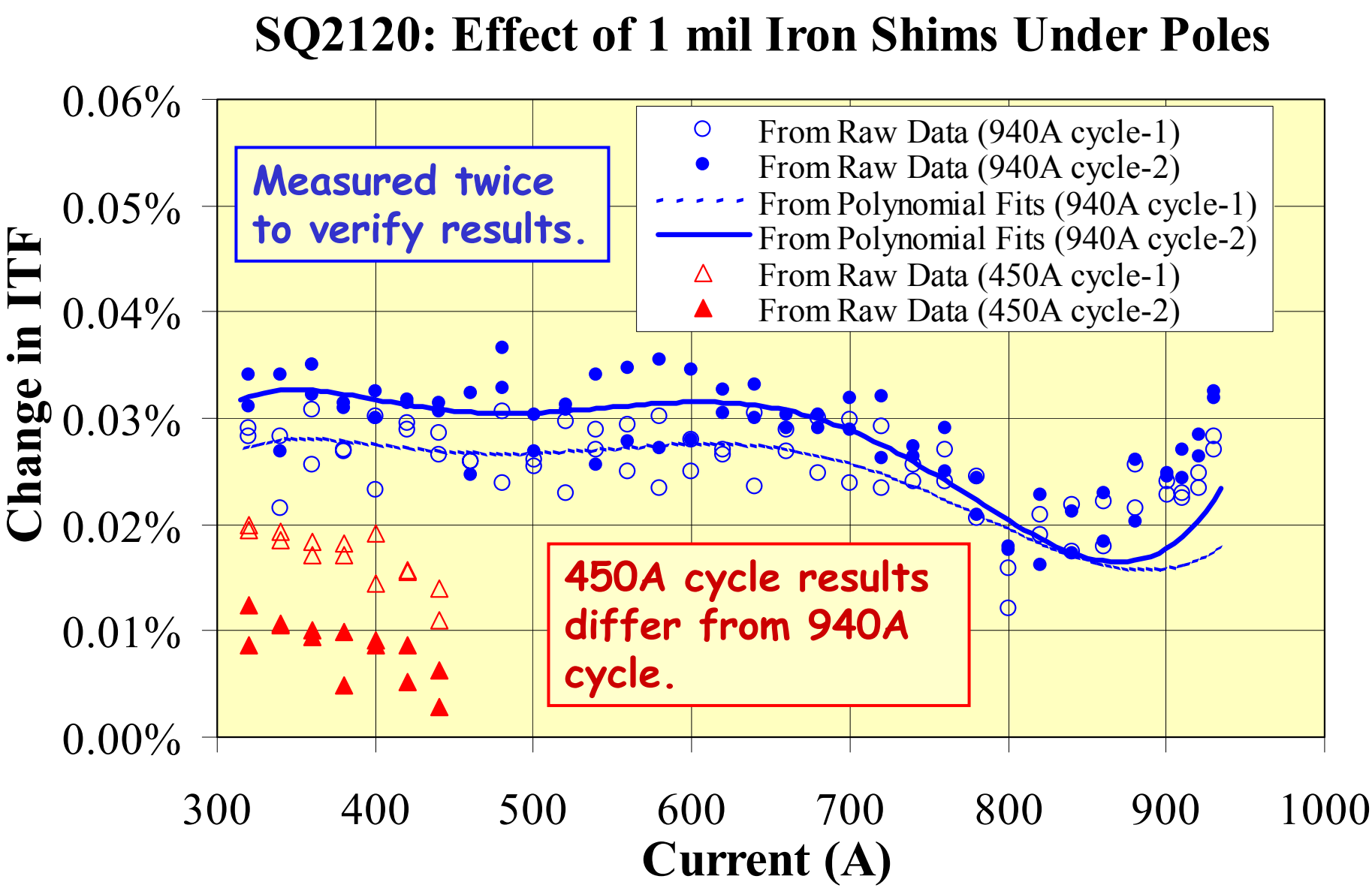

SQ2102: Effect of 1 mil Iron Shims Under Poles
Change in ITF
0.12%
0.10%
0.08%
0.06%
0.04%
0.02%
0.00%
300
400
500
600
700
800
900
1000
Current (A)
From Raw Data (940A cycle)
From Polynomial Fits (940A cycle)
From Raw Data (450A cycle)
"No Shim" Data were taken *before* power supply repair.

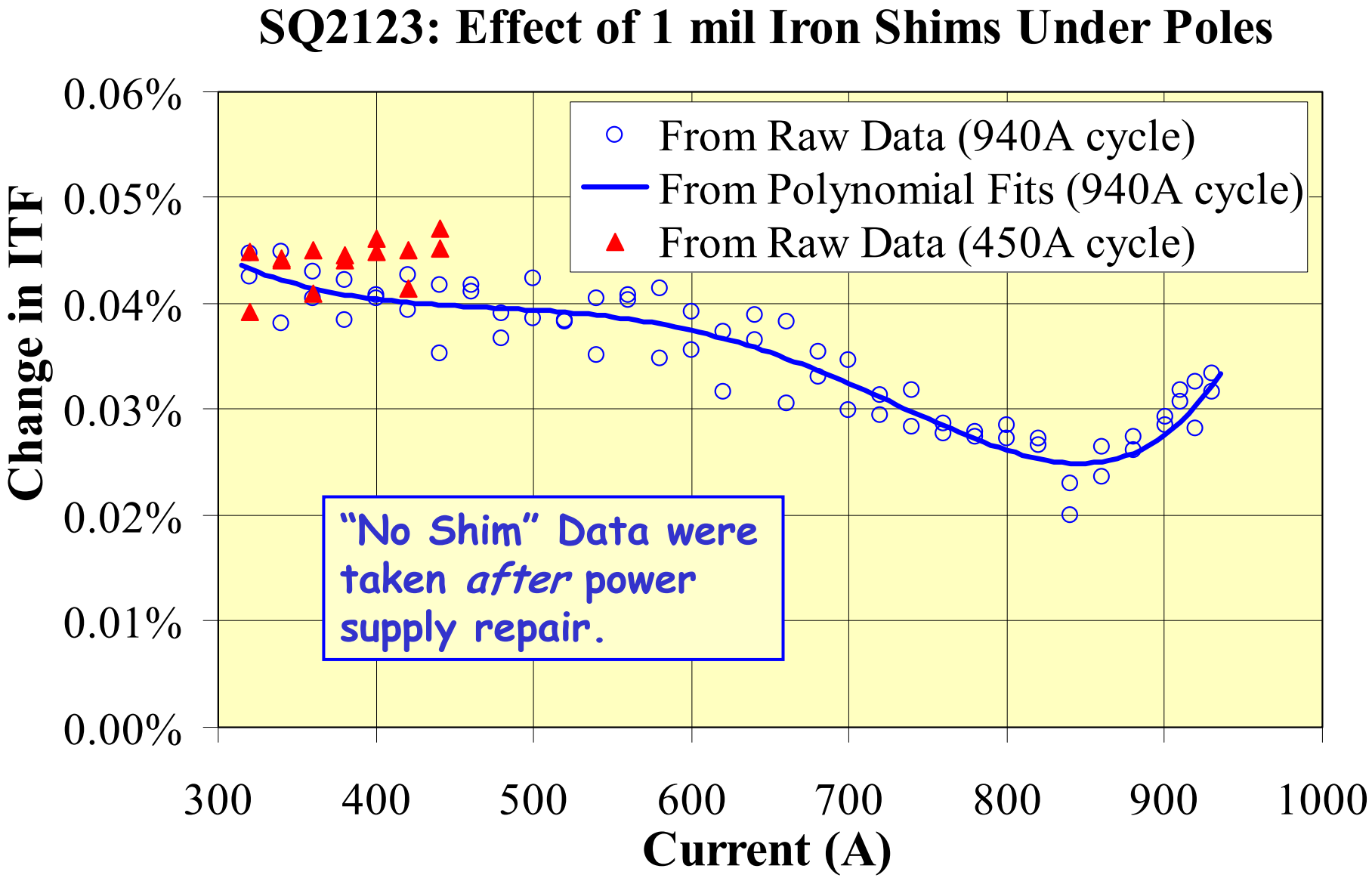

SQ2103: Effect of 1 mil Iron Shims Under Poles
Change in ITF
0.12%
0.10%
0.08%
0.06%
0.04%
0.02%
0.00%
From Raw Data (940A cycle)
From Polynomial Fits (940A cycle)
From Raw Data (450A cycle)
"No Shim" Data were taken *before* power supply repair.
300
400
500
600
700
800
900
1000
Current (A)

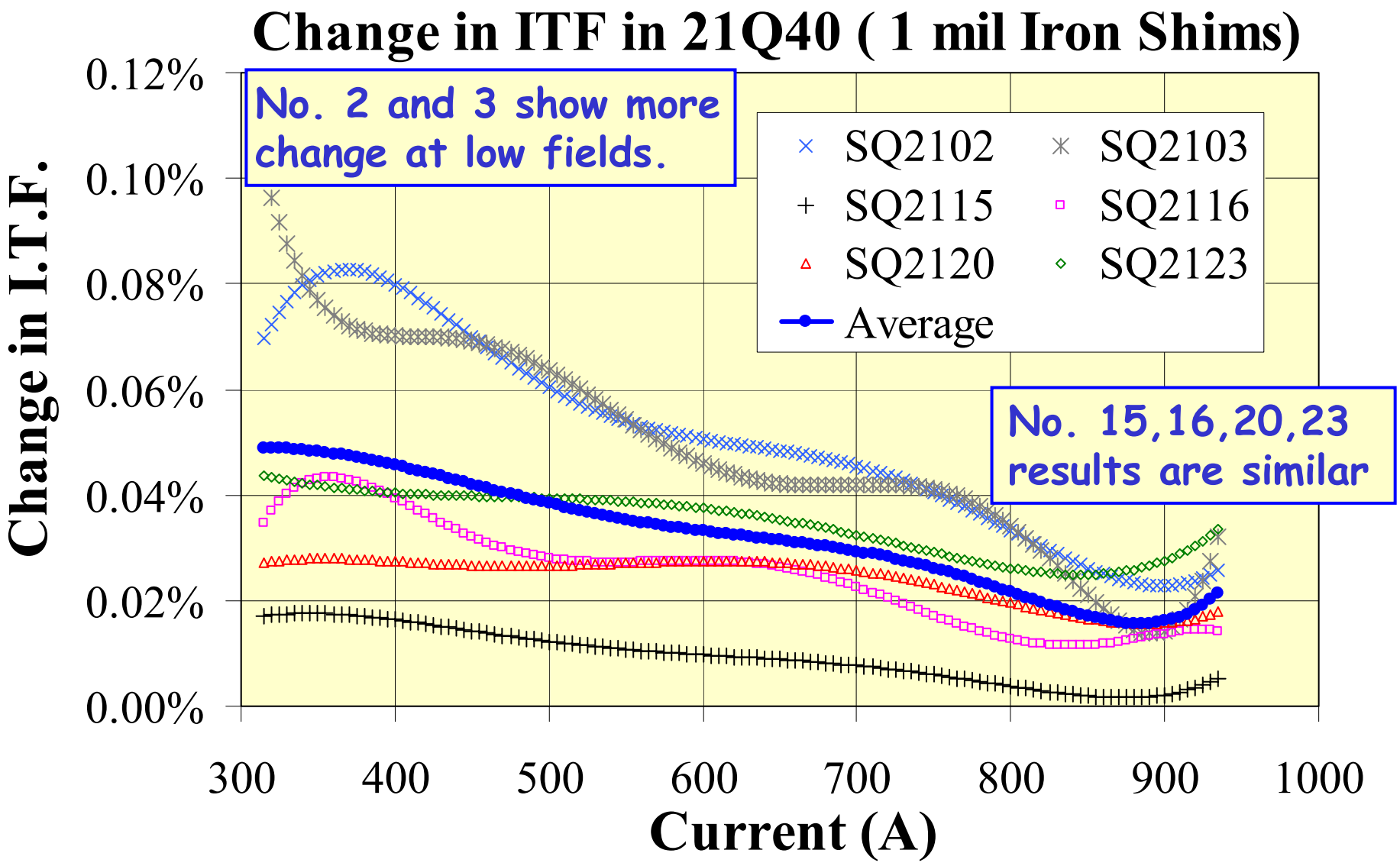
SQ2115: Effect of 1 mil Iron Shims Under Poles

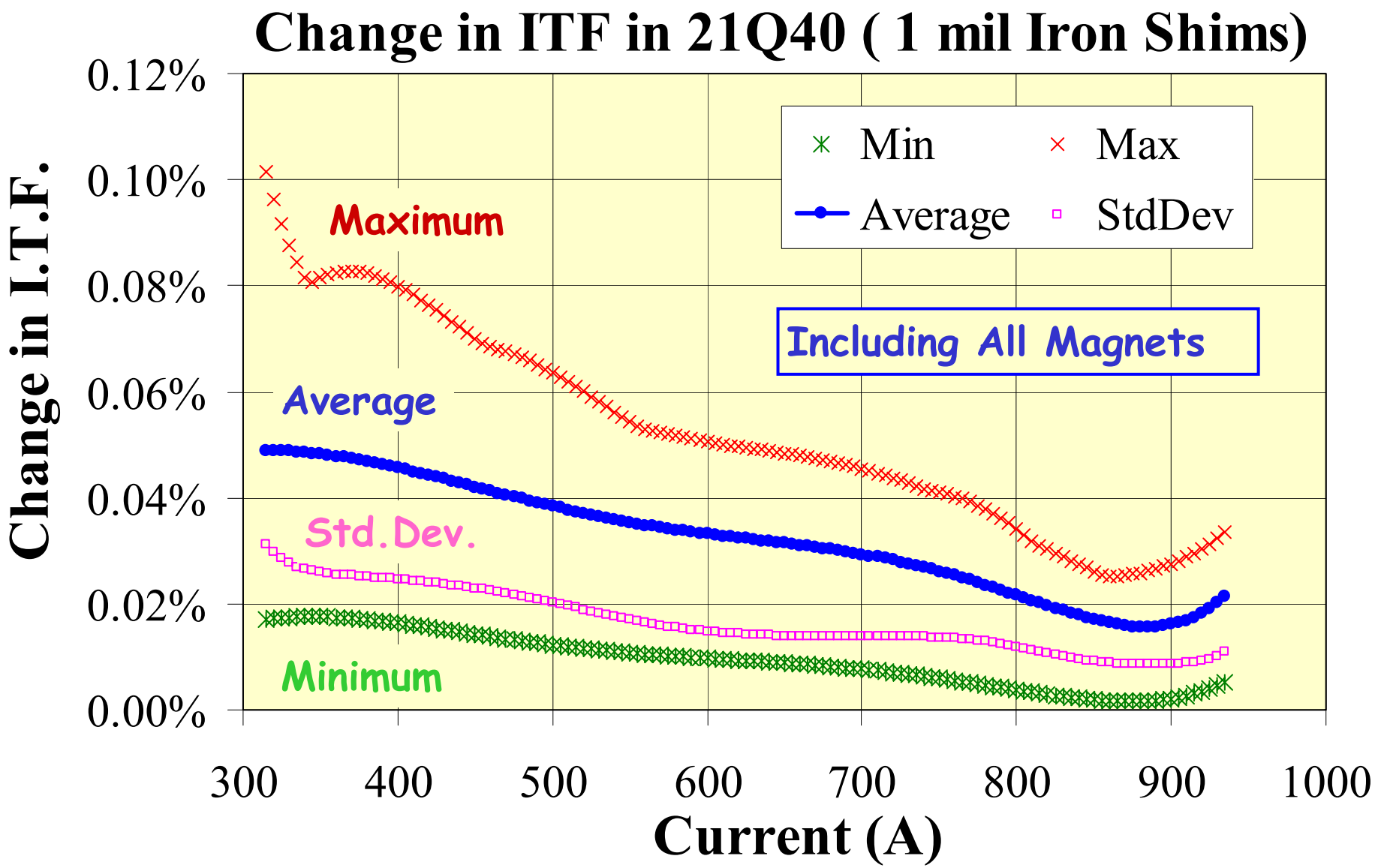


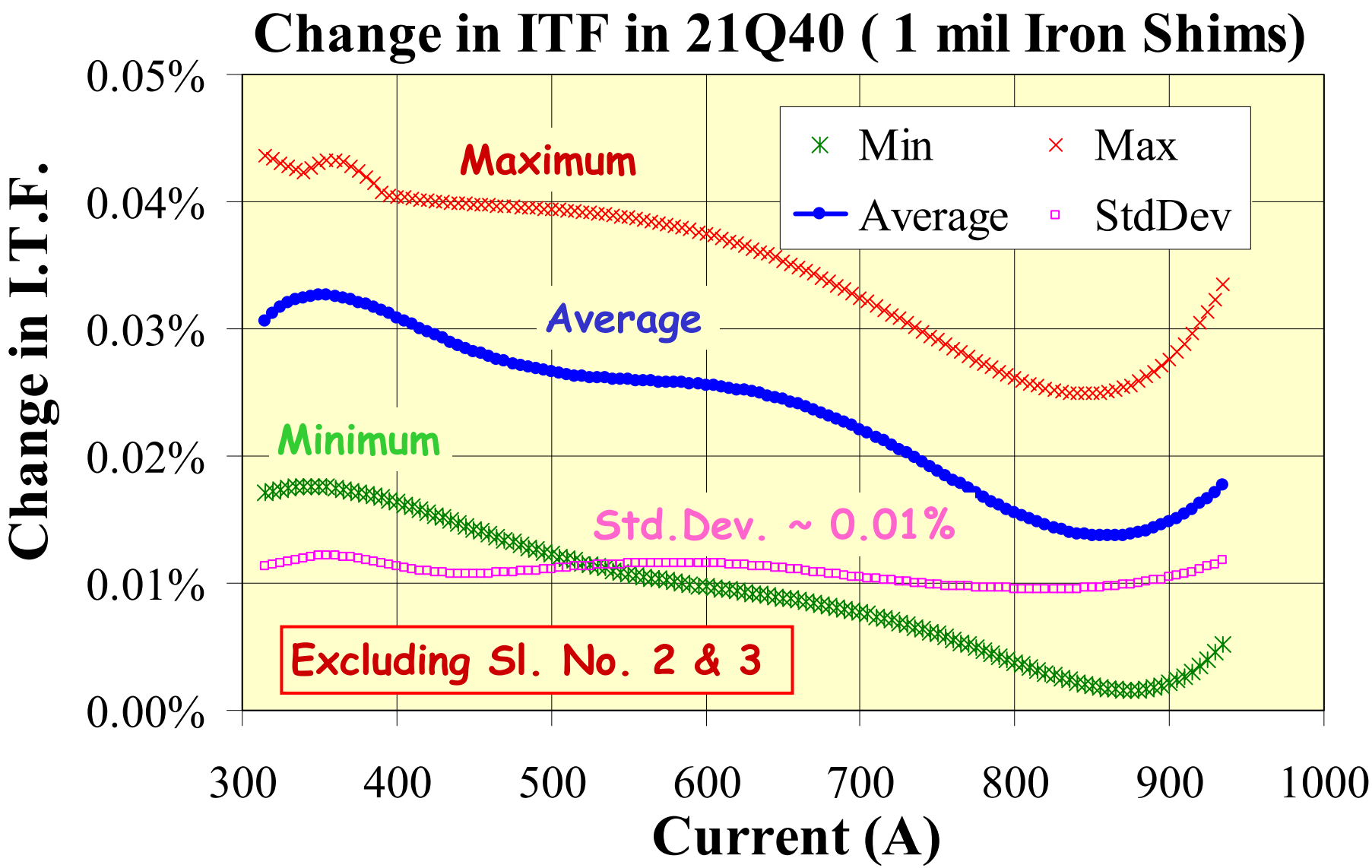

SQ2116: Effect of 1 mil Iron Shims Under Poles
Change in ITF
0.06%
0.05%
0.04%
0.03%
0.02%
0.01%
0.00%
300
400
500
600
700
800
900
1000
Current (A)
From Raw Data (940A cycle)
From Polynomial Fits (940A cycle)
From Raw Data (450A cycle)
"No Shim" Data were taken *after* power supply repair.


SQ2120: Effect of 1 mil Iron Shims Under Poles
Change in ITF
0.06%
0.05%
0.04%
0.03%
0.02%
0.01%
0.00%
300
400
500
600
700
800
900
1000
Current (A)
From Raw Data (940A cycle-1)
From Raw Data (940A cycle-2)
From Polynomial Fits (940A cycle-1)
From Polynomial Fits (940A cycle-2)
From Raw Data (450A cycle-1)
From Raw Data (450A cycle-2)
Measured twice to verify results.
450A cycle results differ from 940A cycle.


SQ2123: Effect of 1 mil Iron Shims Under Poles
Change in ITF
0.06%
0.05%
0.04%
0.03%
0.02%
0.01%
0.00%
300
400
500
600
700
800
900
1000
Current (A)
From Raw Data (940A cycle)
From Polynomial Fits (940A cycle)
From Raw Data (450A cycle)
"No Shim" Data were taken *after* power supply repair.


Change in ITF in 21Q40 (1 mil Iron Shims)
No. 2 and 3 show more change at low fields.
SQ2102
SQ2103
SQ2115
SQ2116
SQ2120
SQ2123
Average
No. 15,16,20,23 results are similar
Change in I.T.F.
0.12%
0.10%
0.08%
0.06%
0.04%
0.02%
0.00%
300
400
500
600
700
800
900
1000
Current (A)


Change in ITF in 21Q40 (1 mil Iron Shims)
Change in I.T.F.
0.12%
0.10%
0.08%
0.06%
0.04%
0.02%
0.00%
300
400
500
600
700
800
900
1000
Current (A)
Min
Max
Average
StdDev
Maximum
Including All Magnets
Average
Std.Dev.
Minimum


Change in ITF in 21Q40 (1 mil Iron Shims)
Change in I.T.F.
0.05%
0.04%
0.03%
0.02%
0.01%
0.00%
Maximum
Average
Minimum
Std.Dev. ~ 0.01%
Excluding Sl. No. 2 & 3
Min
Max
Average
StdDev
300
400
500
600
700
800
900
1000
Current (A)

SQ2114: Effect of 1 mil S.S. Shims Under Poles